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THE

DANISH-ARCTIC EXPEDITION

PROPOSED BY

A. HOVGAARD.

LIEUTENANT IN THE ROYAL DANISH NAVY, LATELY MEMBER OF
THE „VEGA" EXPEDITION.

TRANSLATED FROM THE DANISH BY **G. ZACHARIAE.**

COPENHAGEN.

GYLDENDALSKE BOGHANDEL.

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1882.

»What in the world do you intend to do up in the ice? Of what use is it sacrificing money and life in order to enter those cold and desolate regions, which contain nothing? Should neither Nares' nor de Long's expedition have convinced you of the fact, that nothing is to be attained there?«

These questions have often been asked the author of these lines, and they are an expression of the public opinion; but this opinion is absolutely false. To those, who have examined these questions more sharply, to those, who have passed the entrance to these mysterious regions, the matter appears in quite a different view.

At every step we are surrounded by objects of common interest; we observe the power of the elements almost everywhere acting under abnormal circumstances; they here attain either their Maximum or their Minimum, and in both cases they afford the best possible opportunity to explain the wonders, which nature presents around us, and which not only Mankind's inevitable demand to know everything, but also entirely practical interests bid us explore.

It is a matter of course, that sciences here must gain splendid results; a new era will arise in the history of our globe, when the evidences, now hidden in these immense and unknown regions, be brought to light, for many important, one can almost say the most important questions in nature, will not be entirely solved, until contributions are brought from the environs of the earth's axis, where everything must absolutely appear in the most extreme form, and it is just extremes, bounds, limits, which are necessary to establish a rule.

Yet this is not the only thing. If we look at the history of the arctic investigation, we shall find many as well practical as material results derived where least expected. The first was the whale-fishery; who had ever dreamt before Hudson's travels in the commencement of the 17th century, that the boisterous seas around Spitzbergen and Greenland should be the scene of such extensive trade. Enormous riches have been accumulated in these regions, where yearly large fleets from all nations flocked up for the Whale-fishery, afterwards Walrus- and Seal-, lastly fishing in general.

If we turn our eyes from the sea to terra firma, we find the hunting after furred-animals, which has produced and still produces a lucrative trade; but also here unexpected advantages have appeared. Seeing a flock of Reindeer crossing the ice from the North towards Siberia's coast at Lena's mouth, a merchant named Liaghoff caught the idea to search for land in that direction. He discovered the New-Sibirian islands, and on these islands he found enormous collections of relics of animals, especially those of the elephant of olden time, the Mammoth, the teeth of which in all respects are very much like those of the elephant of our time. He immediately carried on a trade with this sort of ivory, and this trade was in a very short time so considerably improved, that 20,000 pounds in the course of one year were brought from the islands to Siberia and further on to the European market.

Finally, who had ever dreamt a hundred years ago, that in our days cryolith should be brought from Greenland in regular carrying-trade?

It will be perceived from these examples, that the arctic regions can give entirely practical results, and if you answer: »Indeed, but now there cannot be imagined any more,« it may be objected, that this has certainly been said about each of the above mentioned discoveries, but yet new and unexpected sources of revenue have constantly sprung up. True, still the great majority of men looks doubtingly upon the lastly acquired practical result, the new commercial way to Siberia; but it can by no means be expected, that all difficulties should be conquered at the first step, as if by magic. Scarcely seven years have been passed away, since the first ship from the Atlantic reached the mouths of the large Siberian rivers, and we are therefore not entitled already now to entertain too great expectations. However this has been done, and we see, how people after the favourable ice-year 1878 believed, that they could at once run to Siberia and gather a fortune. What was the consequence? People rushed on without studying matters sufficiently and without preparing for eventualities, the possibility of which might be predicted by everybody, who was but slightly acquainted with the circumstances of the case; now, as 1879 was just a very unfavourable ice-year, all the attempts failed except one. Chiefly on account of this quite intelligible mishap, the public suddenly changed its mind, and the new commercial way was declared to be impossible. Nevertheless it is a fact, that a thoroughly considered attempt to make use of it has never yet failed; indeed, the chief difficulties may be said to arise from the absence of population and means of intercourse, and where these are wanting, hardly any commerce of a greater extent may be established. That these defects may be supplied and indeed will be supplied in the course of time, is now very probable, and we shall then again here have a practical result of arctic exploration.

As to further practical results of arctic exploration, they must, quite as those hitherto attained, be classed among the unexpected results, and it is probable, that chiefly coming generations will benefit by the efforts and sacrifices of the present generation; but so goes the world, and if nobody thought of the future, all would probably come to a stand-still.

The same may be said about another kind of results, but in contradistinction to those hitherto named, they are not unexpected; on the contrary they can be distinctly pointed out. We here think of scientific results, which however after all will at last also be of practical importance.

We know, that the arctic seas are rich in animal life, and if we investigate them by means of scrapers, drags and the like and examine even the smallest individuals of this world of animals, we obtain a thorough insight into the whole economy of organic nature. As for the larger inhabitants of those seas, we still know proportionally little about them, about their wanderings, their relationship, the conditions, under which they live, their geographical spreading, and how the relation of the latter is connected with the large currents of the sea. It is thus supposed, that the whales spend a certain time of the year in the far North, but where and why we don't know. It is often mentioned, that the catch of whales is in decreasing, and the natural consequence is, that other places of catching must be sought. We constantly see the birds wander to the north; consequently there must be both a lower animal life and a vegetation, about which we as yet know nothing.

How far do the bear, the fox, the musk-ox and the hare go to the north, and under which circumstances do they live there?

We thus see, that there is enough to be done within the limits of Zoology, and the same may be said of Botany. There is in the arctic regions a rare and special vegetation, about which we know rather little and the botanist longingly looks forward to further results, that may assist him in ascertaining the geographical spreading of plants. As for the examination of the winter-sleep of plants, the arctic regions are of course peculiarly interesting.

Regarding Anthropology we may expect great results. It is a problem of the greatest interest to investigate, whether the races, inhabiting the far North, are descended from races, inhabiting or having inhabited temperate zones, and whether they have only degenerated under the influence of the climate and the special circumstances, under which they live.

How much of the history of mankind will be elucidated by throwing light upon this question!

Only a little more than one third of the arctic regions has been explored, and even in the most barricaded solitude there have been found traces of former habitation, and even if these are only remains of times gone-by, we have yet here an excellent occasion to study a people, that is likely to have been on the same stage of development as people were here in the stone-age. As will be shown below, we have in all likelihood still a country untrodden by the explorers of our day, and who knows, whether there will not in these regions be found traces of a former habitation, even if not still living races.

Perhaps still greater results may be expected in the domain of Geology. In the first place the circumstances of the arctic regions are now those, which have been formerly those of our part of the world, and secondly we know, that the climate of these northern regions has once been better. Where all now is covered by ice and snow, the Mammoth was formerly wandering in luxuriant forests, about whose abundant vegetation we are told by the petrifactions found there. We are now to complete the scanty results, gained by the petrifactions hitherto found, and by this means it will at last be possible to ascertain, why and how this enormous change has been brought about. Is the reason of this an alteration of the centre of gravity of the earth and a movement of the axis consequent upon the same? Both this and many other questions can only be answered by a continuous investigation, which does not forget any accessible nook of our earth.

Only thus full light may be thrown upon the history of the earth, which acts so great a part in the secret of all the existence.

The knowledge of the form and physical nature of the earth cannot become complete, as long as it rests upon geodetic and astronomical measurements, for both are highly influenced by the force of gravity. Pendulum-observations are therefore of the greatest importance in the high latitudes and peculiarly in the neighbourhood of the pole itself.

The importance of physical observations becomes perhaps still more evident, if we remember, how useful electricity and magnetism are already now, and yet we do not thoroughly know the nature of these powers. What is electricity? What is magnetism? Which is their mutual connection? However it is probable, that, if these questions had been answered, those natural powers would be of much greater use to us than now, but these questions can only be answered by continued observations and especially by observations in arctic regions, where those powers are acting under so abnormal circumstances. How far the »Aurora Borealis«, that wonderful natural phenomenon, which can only be observed in arctic regions, is connected with the named natural powers, and which part it acts, is also a question of the greatest importance, that Spectroscopy has given us the means to answer; but there have hitherto only been made very few observations of this kind, and as many observations in many different places of the arctic regions are necessary, a constant repetition of arctic expeditions is required.

As to Meteorology it is not at all to be doubted, that our climate is greatly influenced by our neighbourhood with the arctic regions, where it consequently must be of the greatest importance to ascertain the laws of the temperature, pressure and movement of the air, and, as far as these things are influenced by sea-currents, hydrographical observations also become of invaluable importance.

It is a matter of course, that the arctic climate is greatly dependent on the distribution of land and water, and we must therefore also admit the importance of ascertaining this. But this importance becomes the greater, because it is impossible to make regular observations without arranging them, as the international, chiefly physical, exploration commencing this year has been arranged. However, to organize such an undertaking, it is necessary to know, where the different parties are to be put, and we therefore beforehand must know the territory, on which the action is to take place.

The first step to arctic exploration thus becomes charting, but it is a matter of course, that an expedition now-a-days must not necessarily be confined to this result, as observations of any kind may be made at the same time.

The result, that can be attained by the international expedition going out this year, is of course very great; but it is of no use to be content with it, nor will it be so. As we have shown above, every spot must be examined, before the final result can be attained, and still more than 800,000 □ miles round the North-Pole are altogether untrodden and unknown.

Consequently we must go on; the exploration must, if possible, be extended to the immediate neighbourhood of the North-Pole. We shall now examine, how far this is possible.

When we speak about reaching the North-Pole, we intend to attain this by the means being hitherto to our disposal, viz the ship and the sledge, whether the latter be drawn by men or by animals. What the future will bring, it is of no use considering at present, and as long as we neither can steer a balloon nor have materials, of which it may be thus constructed, that it is possible to use it in the cold, this ctonveyance may with a safe conscience be left out of consideration.

But if we are to make our way by means of ships and sledges, it is necessary to follow a coast. The fate of the »Tegetthoff«, the »Jeanette« and many others warns against venturing in among the drifting masses of ice and leaving the coast; only there casualities may be mastered to a certain degree. On a coast a port is often near at hand, or you may, as the »Alert« in 1875 or the »Vega« in 1878, find shelter against the ice-pressings behind some larger grounded piece of ice. Further you in a certain part of the year are entitled to expect finding an open coast-channel, for on steep coasts ebb and flood will at any rate break the ice, and on shallow coasts the large ice will by its draught be prevented from altogether reaching the shore, and the ice of the year will always yield to he sun, the fog and the rain. If besides there are currents going in the direction of the coast, we may the more rely upon finding open water at a certain season of the year.

Also for sledge-travelling it is most advisable to follow the coasts. Both Parry's attempt in 1827 to reach the North-Pole from Spitzbergen and Markham's attempt to go northward from the winterquarters of Alert have shown us, that we often are drifting more back on the ice, than we advance on it, and further, that the polar pack-ice is of such a nature, that even the most heroic exertions will soon prove unavailing. But along shore matters generally stand otherwise, the direction of the large elevations being parallel with this, and the journey itself consequently becoming easier. Further, by exploring the land we follow, we learn much more in all branches of science, than the little to be learned on the ice. Sledge-travelling by land, if the country is high and mountainous, is very troublesome and, if there are glaciers, also dangerous. In short, you get on farthest and most safely and also learn the most by following a coast. If the North-Pole is situated in the midst of a sea, it is scarcely to be reached by our means; better it would be, if the Pole were situated in the midst of a continent; but, even if it should prove impossible to reach the North-Pole itself by our means, we must be content with getting as near the same as possible, until new means have been invented; and the unknown regions being, as we have said above, of an extent of more than 800,000 □ miles, there is plenty of work to be done in the next future; it must moreover be remembered, that observations in this point itself, the North-Pole, are of course only a link of the whole chain of observations, but that observations in all other places are also required, in order that the final result may be attained.

The question consequently becomes this: Is there a shore, along which we may reach the North-Pole or at least its neighbourhood?

At present we do not know it for certain; but if we make use of what we know to imagine, how land and water are in large features distributed in the unknown regions round the North-Pole, we shall see, that the existence of such a shore is by no means impossible.

To examine different probabilities respecting the fate of the »Jeanette«, the author of these pages was obliged to make a sketch of such a distribution, and on further reflection he attained the result, shown on the map accompanying this pamphlet.

The two white spots on the map near the North-Pole are meant to represent two continents or groups of islands which, as will be seen, are separated by a strait; but it must beforehand be observed, that no outlines have been drawn, as it is only intended to hint, that there must be a land in each of those white spots, while it is of course impossible theoretically to point out a definite coast-line; however, there can hardly be found land outside the two white spots, whereas it is indeed possible, that the mentioned lands do not spread over the whole white area. It is likewise possible, that the above mentioned strait is situated somewhat more to the east or to the west, nay, there may possibly be several straits; it has only been intended to intimate, that there must be somewhere in these regions a connection between the eastern Siberian Sea and the Paleocrustic Sea, as Nares called the sea to the north of the American arctic Archipelago.

Taking now a view of what Markham so appropriately calls the threshold of the unknown regions, we shall point out the different reasons, that lead to the supposition of this distribution of land and water in those regions.

If we begin with Spitzbergen the depth in the different places of the sea makes it probable, that the Atlantic is extending far to the north, as we still north of this group of islands find a deep of more than 1300 fathoms, which between Greenland and Frantz Joseph's Land is extending in a northern direction. Parry saw still on 82° 45′ northern latitude radiant ice-blinks to the north, whereby it was clearly proved, that the coarse pack-ice, on which he was travelling, extended much farther in this direction. The circumstance, that he on this latitude found the drift of the ice going more in a southern than in a western direction, seems to imply, that Frantz Jospeh's Land must have the western limit, that has been indicated on the map.

Payer mentions, that all the ice-bergs in the Austria Sound were drifting northward, which seems to indicate a larger opening of the Sound in this direction. It is therefore an obvious conclusion, that the part of Frantz Joseph's Land, situated in the west of the Austria Sound, is only a belt of islands, that has scarcely any great extent to the northwest. The northerly winds in the winterquarters of the »Tegethoff« were also proportionnally warm, which seems to prove, that there are no larger tracts of land in this direction.

If we now turn to Greenland, all seems to indicate, that this country is scarcely extending much farther than 83° northern latitude. We know the eastern coast thoroughly to Cape Bismarck, and in 1670 it is said to have been seen two degrees of latitude farther to the north by Lambert in the place marked out on the map. The sledging-party, that was sent to the east from Nares's expedition under the command of Beaumont, followed the western-coast of Greenland up to 50° western longitude, and the most northern point, which Beaumont saw thence, did not reach 83° northern latitude. Comparisons of winds and currents, observed on both sides of Greenland, lead to the conclusion, that the coast near Beaumont's most northern point is turning to the south towards Lambert's Land and Cape Bismarck. Professor Haughton's examinations of ebb and flood lead to the same result: the time, at which the tide-wave, having followed the eastern coast of Greenland in a northern direction, reached the winter-quarters of Alert, necessitates a passage, that cannot be situated much farther to the north than 83° northern latitude.

Consequently the sea is extending from the regions north of Spitzbergen northward round Greenland, so that the Atlantic is uninterruptedly connected with the Paleocrustic Sea of Nares.

This has in the course of time been enlarged by little and little. From the immobility of the ice-masses, which Collinsen found north of Bering's Strait, that both he and M'Clure followed along the northern shore of America from Point Barrow to the east and thereupon up along the western coast of Bank's Land, Sherard Osborn derived the theory, that they floated on an arctic ocean closed on all sides, which he imagined to be limited by a northern continuation of the Parry-Islands.

However Belcher's observations in Northumberland Sound indicated, that there were larger, landless regions to the north and west, among other things, because storms from these directions caused a violent rising of the height of the water, and the ice was often broken up, and lately Aldrich, on his sledging-journey in 1876 from the winterquarters of Nares to the west, has shown, that Cape Columbia is the most northern point in the American arctic Archipelago, and that the coast at 83^0 western longitude is turning to the southwest.

Petermann would limit this arctic ocean by a continuation of Greenland over the North-Pole down towards Wrangel's Island, but also this has now been disproved, and consequently we have the open sea extending with a broad arm down to Point Barrow.

How broad this arm is, we do not know, but judging from the nature of the ice and several other circumstances, we must believe it to be rather considerable. However, to come to its northern and western limit, we must continue taking our view.

That there is a country north of Wrangel's-Island, whose sonthwestern coast is extending towards Cape Tscheljuskin, cannot at-all be doubted. As the circumstance, that the northern and particularly the northeastern winds in the winterquarters of the »Vega« were proportionally warm, indicates the existence of the above mentioned landless regions, so the circumstance, that the northwestern winds brought cold, indicates, that there must be a country of considerable extent to the northwest of us, which is also confirmed by the nearly tradewindlike character of these winds.

The existence of the country is further proved by the flight of the birds, as the destination of the immense masses of birds of various species passing by our winterquarters could not possibly be Wrangel's Island; for the Americans, who visited it, expressly mention the striking absence of animal life in the midst of summer.

If we consider the depth in the different places, the existence of the country is also proved thereby. When Berry on the steamer »Rodgers« stood NNE. from Wrangel's Island in 1881, he found increasing depths, whereas, when he from the said island stood due North, he found but a depth of 32 fathoms and north of this again some and twenty fathoms. True, he did not see the country, but he also only reached $73\frac{1}{2}^0$ of northern latitude, so it may very well be, that the country begins on 75^0 of northern latitude, nay, even still farther to the south.

Presupposing, that the southern point of the country is situated on 75^0 northern latitude, the eastern coast of the most southern part of the country must extend in a nearly northern direction, considering the aboved named depths and the winds in the winterquarters of the »Vega«. If we go farther to the north, the country must on account of Belcher's observations be kept within the limits indicated on the map, and it is likewise so north of the winterquarters of Nares. At the sitting taking place in the Royal Geographical Society to welcome the returned North-Pole Expedition Nares uttered among other things the following: »Whether the sea, on whose shores we spent 11 months, is extending to the Pole or over the Pole, cannot be absolutely decided; but a broad opening there must be to the north of our winterquarters, and I have every reason to believe, that it extends at least to the Pole.«

Going now back to the southern point of the unknown country north of Wrangel's Island in order to examine its southwestern borders, we have a good guidance in the drift of the »Jeanette«. We must regret still to know so little about it, but we may yet already suppose the following:

Dannenhauer says, that they were constantly drifting to the northwest from the Herald's Island, for the first 5 months but 36 miles; for the following 9 months they were drifting somewhat faster, and for the last 6 months, before they left the ship, the drift became so fast, that they were constantly in an imminent danger. The distance, we speak of here, is about 500 miles, and supposing, that the speed has for the 9 months been above one mile in 24 hours, for the last 6 months two miles in 24 hours, this just gives the 500 miles, and by laying-down on a map, it will be seen, that, when the current became strong, consequently about new-year 1881, the were just south of the supposed southern point of the unknown country and nearly 73^0 northern latitude. Only here they appear to have got really into a current, that consequently runs from the east round the southern point of the country, and in consequence of the direction of this current from the said point, the chief direction of the coast from the southern point must be presupposed to be northwest.

As well Berry's as Wrangel's and Anjou's measurings of depth indicate, that a large flat connects the unknown country with Asia between the New-Siberian Islands and Wrangel's Island. The three islands, discovered by the »Jeanette«and marked out on the map according to the approximate statement of Dannenhauer, are likely to be situated on the northwesterly edge of this bridge, for Dannenhauer says, that the greatest depth, they have found, is 80 fathoms, but he certainly does not add, where it has been found. However, as Wrangel and Anjou have constantly 12 to 14 fathoms of water between New-Siberia and Wrangel's Island, it is probable, that the mentioned great depth has been found towards the close of »Jeanette«'s drift. While the Bennet Island resembles the New-Siberian Islands, the Henrietta Island and the Jeannette Island have a character rather reminding of Wrangel's Island and the Herald Island, and the deep water may therefore be supposed to have been found in the neighbourhood of the latter islands.

As will be perceived, the islands, discovered by the »Jeanette«, form a beautiful link of the bridge, which the ancient Omokes are said to have made use of on their wandering to the unknown country to the north, where perhaps greatly surprising phenomena will reveal themselves to the inquiring discoverers of Europe and America, who surely will reach it sooner or later.

If we now go on towards west to Cape Tschel juskin, we on the »Vega«, immediately after having passed by the most northern point of the land, found a depth of 70 fathoms close to the shore, and somewhat farther to the east Prontschischtcheff in 1736 found 120 fathoms of water without any bottom.

To the west of Cape Tscheljuskin the water on the contrary is shallow, and it must therefore be supposed, that the deep water to the east of this point is not connected with the deep water between Novaya Zemlya and Frantz Joseph's Land, to be mentioned below, but that it is rather connected with the deep water in the neighbourhood of the Henrietta Island. Consequently we have north of the New Siberian Islands a proportionally deep sea and a current running to the northwest, as far as it has hitherto been traced.

Considering now, that Nares mentions, that the ice near his winterquarters for some reason, which he was unable to explain, was from the north set in towards the coast, it seems to be a very natural explication, that there exists a connection between the mentioned deep north of Siberia and the deep north of Spitzbergen and Greenland, in other words, we thereby come to the northwestern border of the unknown country north of Wrangel's Island, indicated on the map.

If we finally turn to Frantz Joseph's Land, many circumstances indicate, that it is extending eastward to the neighbourhood of Cape Tscheljuskin. First, Payer mentions the mighty Dove Glacier on the eastern side of the Austria Sound, whose front is extending in a north-southerly direction on more than 1/2 degree of latitude. It absolutely necessitates a large upland, which is most naturally sought in the direction perpendicular on its front, consequently in a direction, which just points to Cape Tscheljuskin. Secondly, a very large, collected flock of Brent-geese or Bernacle-geese was seen at this point in 1878, evidently advancing southward from a country situated north of Cape Tscheljuskin, The constant northeasterly winds, observed in the winterquarters of the »Tegetthoff«, also indicate a larger land in this direction, and lastly the depths in the northern part of the Kara Sea indicate the same.

The deep sea-arm, going between Novaya Zemlya and Frantz Joseph's Land into the Kara Sea, turns southward along the eastern shore of Novaya Zemlya and extends right down past Jugor Schar, while farther to the east, in a line due north from the coast of Asia on the degree of longitude of the Solitude Island quite up to 78° northern latitude, there is no greater depth to be found than 50 fathoms. When the »Vega« crossed the Bay of Taimyr, also but small depths were to be found, whereas we, as above mentioned, found deep water immediately to the east of Cape Tscheljuskin. We therefore naturally conclude, thåt Frantz Joseph's Land is not far from Cape Tscheljuskin, but that its coast is here turning in a northerly direction. If it is also remembered, that the whole region between Jenisei and Novaya Zemlya has in all likelihood originally been deeper water, but that the rivers have in the course of time filled up here, we should scarcely be able to explain the sudden cessation of this filling-up just at Cape Tscheljuskin, if it were supposed, that there was a broad sea-arm north of this point, whereas the whole question may be easily and naturally explained, if there is but a strait.

We have now finished taking our view both of the outskirts of the North-Pole and of the two unknown countries, whose form has thus been marked out in large features.

If we will now on the basis of this theory examine, from which point we may in the best manner enter the unknown region and approach the Pole as near as possible, we must leave all the former routes. Nordenskiöld's and Parry's experiences warn against using Spitzbergen as a basis, those of Nares against Greenland and Smith Sound, and it has been proved, that on these routes there is not much prospect of reaching farther than 83^0 northern latitude.

If we compare the experiences of de Long, Berry and Hooper with the results attained by Collinsen and all other discoverers north of Bering's Strait, we must consider the advantage of going northward via Bering's Strait as very doubtful. To be sure we have here perhaps more than anywhere else prospect of finding a shore going in a rather northerly direction and leading to high latitudes, but on the other hand the prospect of reaching the southern commencement of this shore is as yet very slight.

If finally we come to Frantz Joseph's Land, the fate of the »Tegetthoff« as well as the experiences gained of late years by the Dutchmen on their voyages in »Willem Baerentz« have shown us, that it is very difficult to reach the western coast of this land, although the voyage of Leigh-Smith with the »Eira« in 1880 speaks somewhat to the advantage of this route. However, from what we know at present, we can only conclude, that it is perhaps possible to reach the Austria Sound every four or five years, but even if an expedition reached it in a favourable year, its stay there might easily be longer than desirable, so that the whole undertaking must be looked upon as a very hazardous one.

But, what would be worth a serious attempt, is reaching Frantz Joseph's Land via Cape Tscheljuskin, for it cannot be doubted, that we, by following the coast of Asia, may reach Cape Tscheljuskin, and if Frantz Joseph's Land is indeed near this point, we are likely here to reach the basis of our operations more easily than in the other points.

It has already been objected, that we should find the same circumstances of current in this strait as between Novaya Semlya and Frantz Joseph's Land, viz an easterly current in the southern part and a westerly current in the northern part of the strait, and that the circumstances of ice would therefore prove as unfavourable here, as the »Tegethoff« found them north of Novaya Zemlya. This is surely possible, but hardly probable. First, the drift of the »Tegetthoff« was no doubt chiefly caused by the direction of the winds; but even though there be currents of the mentioned kind north of Novaya Zemlya — if there is only a shallow strait north of Cape Tscheljuskin — it is very natural respecting currents to look upon the Kara Sea as an inner sea quite as the Kattegat and the Baltic. We know, that the current in the Skager Rach is regularly standing westward under the coast of Norway and eastward along the coast of Jutland, and the same phenomenon might be imagined to take place between Novaya Zemlya and Frantz Joseph's Land, the current chiefly remaining in the deeper regions of the sea.

If there were a west-going current north of Cape Tscheljuskin, it must probably be connected with the large current, with which the »Jeannette« was drifting, and it would then be perceived much more distinctly both north of the Solitude Island and south of the Austria Sound, than has as yet been the case. In both places entirely local currents seem to prevail. When the Austrians left the »Tegethoff«, they, as is well known, were for the first two months drifting due north, consequently perpendicularly on the supposed direction of current. Leigh-Smith also observed, that the drift of the ice went in a northern and southern direction. Johannesen mentions a current near the Solitude Island coming from the north, and this circumstance may be naturally explained by some formation of frith on the southern coast of Frantz Joseph's Land, that consequently in this place does not seem to be far away.

But the current, with which the »Jeannette« was drifting, must in consequence of the rotation of the earth have a tending to go eastward and consequently to follow the western coast of the unknown country north of Wrangel's Island, so it is even possible, that to the north of Cape Tscheljuskin there is to be found but east going current, which, owing to the water from Ob and Jenisei, must be warm. However, it seems to appear from the observations on the »Vega«, that this current is very slight.

If only the south-eastern point of Frantz Joseph's Land is reached, there will no doubt be found a coast going in a rather northerly direction, and following this the traveller will perhaps come into a strait, where it is possible to reach the opposite shore, which, as we have shown, leads to very high latitudes.

As an unfavourable circumstance of this route it has been pointed out, that, to reach the mentioned northern strait, it would be necessary to follow the eastern shore of an arctic country, many authorities pretending, that in arctic regions shores looking eastward are always more blocked up by ice than those looking westward. We however suppose, that this generally depends upon local circumstances of wind and current. As for the eastern coast of Greenland it has been proved, that the difficulty of reaching it depends upon a current, which comes from the north, being pressed against the land as a consequence of the rotation of the earth. In the present case we however have a current coming from the south, which then, in consequence of the same law, is turning to the east, that is to say: it is pressing against the western coast of the unknown country north of Wrangel's Island, and the opposite eastern coast of Frantz Joseph's Land may therefore be supposed to be more passable, as there is no reason whatever to believe, that it is being washed by a south-going current.

However the whole matter depends still upon a theory, but by such a one every practical enterprise must necessarily be preceded, if it is not to be altogether planless. Everybody knowing the history of arctic exploration also knows, that the expeditions undertaken have always been preceded by a theory, whether right or wrong, and therefore the theory set forth here may perhaps claim some attention.

But to derive advantage from the new route, it is necessary to follow a definite plan; it is of no use on the basis of a theory at once to fit out great expeditions, that will perhaps fail at the first step. It is first to be ascertained by a reconnoitring expedition, that Frantz Joseph's Land is really extending to the neighbourhood of Cape Tscheljuskin, that the circumstances of current and ice are such, that a basis of a further proceding can be reached here without too great a risk, and finally that the eastern coast of Frantz Joseph's Land on this point turn to the north. When these three things have been practically proved, the route may be said to have been opened, and great expeditions can then follow in the trace of the reconnoitring expedition and proceed farther in the unknown regions, to which the door will thus have been found.

Indeed the whole exploration of these regions must be looked upon as an international obligation, of which every nation, that does not want to come to a standstill, must take a part according to its means. The small nations can therefore only undertake fewer or smaller expeditions, but when an opportunity offers to perform something proportionally great and accomplished with small means, it seems natural for a small nation to seize upon this opportunity.

Such a reconnoitring expedition, as the above mentioned, if it succeded in proving the correctness of the afore said theory, would not alone open a new way but probably open the only way for further exploration in these regions, and, as will be shown in the following, the expenses would be so small, that the attempt would certainly be advantageous, as the expedition, even if it returned with an answer in the negative to the three questions, which occasioned its departure, would yet bring home results of great value, particularly if it were undertaken in 1882-83.

Such an expedition should then be planned as follows:

A steamer fit for ice-navigation and with a crew of 20 men, six of whom might be officers and scientific men, should go into the Kara Sea in the beginning of August 1882. The expedition should at this time be furnished with provisions for 27 months, with coals for steaming 5 à 6000 miles, with a complete sledging-outfit to ensure a retreat and besides with 8 dogs for the exploring-travels proper.

If the straits to the Kara Sea were not yet open on the arrival of the expedition, the time should be improved by surveyings west of these, and it would be of particular importance to find some roads, where ships, going in future to Ob and Jenisei, might safely await the breaking-up of the ice in the straits. Besides of course all kinds of scientific observations should be undertaken. During the navigation over the Kara Sea important results with regard to the completion of the charts might be expected, and the measuring of the Malygin Sound would be of especially great importance. As soon as the expedition had passed by Jenisei, it would be in a sea, that has but once been visited by a scientific expedition, and there would consequently be plenty of work to do. If the circumstances of ice allow it, the expedition should thereupon advance northward from Cape Tscheljuskin; howewer the ship must not be exposed to any greater danger. If it should prove impossible to get northward, the expedition must go into winterquarters near Cape Tscheljuskin, and the exploration of the regions north of this point must then be effected by means of sledging-travels both in the autumn and in the spring. In the course of winter physical observations should be undertaken, and just in the winter 1882-83 these would be of great importance, as observations at the same time are made on the international stations, in whose chain round the North-Pole the expedition would form an excellent link, situated, as it would be,. between the stations at the mouths of Jenisei and Lena. But if on the contrary the theory set forth here proves correct, and the expedition consequently reaches Frantz Joseph's Land in the summer 1882, the sledging-travels would give a still better result. With 3 men and 8 dogs you may be absent from the ship for 70 days, and in this time a distance of 800 miles may easily be performed, even without advanced depots, by which the length of the journey may be extended still farther. If the theory holds good, such a sledging-party would be able to go six or seven degrees of latitude to the north of the winterquarters and thus possibly be able also to prove the existence of the northern strait. At the breaking-up of the ice in the summer 1883 the expedition, if it had not yet succeded in reaching Frantz Joseph's Land, might make a last attempt to push on northward and thereupon return to Europe.

The expenses of such an expedition would be:

Provisions	*) crowns Danish	30,000
Coals etc.	—	7,000
Wages	—	20,000
Instruments, Clothes etc.	—	5,000
Sledging-materiels and dogs	—	5,000
Unforeseen expenses	—	12,000
	crowns Danish	79,000

to which must be added the expense to the purchase of the ship. According to informations, procured by the author of this pamphlet, a suitable vessel is at present to be had for the sum of 26,000 crowns Danish, and if we add 20,000 crowns for reparation, the sum total will only be

125,000 crowns Danish.

The intention of this small pamphlet is proposing these means procured in Denmark. Even at worst the results brought home by the expedition will indeed be worth more than the aforesaid sum, and, as we have shown, our small country has here prospect of solving a problem of the greatest importance to future arctic exploration.

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*) 18 crowns Danish = 1 £ St.

Pioneering but seldom falls to the lot of a small nation; but when a possibility for this presents itself, ought we not then to make a sacrifice, especially when this sacrifice is not greater than that mentioned here.

Copenhagen, March 1882.